

REMARKS

Claims 1-12 remain present in this application.

Claims 1 and 12 have been amended. Reconsideration of the application, as amended, is respectfully requested.

Rejections under 35 USC 102(b) and 103

Claims 1, 8 and 11 stand rejected under 35 USC 102(b) as being anticipated by BACCHETTA et al., U.S. Patent 5,627,403. This rejection is respectfully traversed.

Claim 7 stands rejected under 35 USC 103 as being unpatentable over BACCHETTA. This rejection is respectfully traversed.

Claims 2, 3 and 10 stand rejected under 35 USC 103 as being unpatentable over BACCHETTA in view of HIGASHITANI et al., U.S. Patent 6,346,737. This rejection is respectfully traversed.

Claims 4-6 and 10 stand rejected under 35 USC 103 as being unpatentable over BACCHETTA in view of WOLF et al., Silicon Processing for the VLSI Era Volume I: Process Technology. This rejection is respectfully traversed.

Claim 9 stands rejected under 35 USC 103 as being unpatentable over BACCHETTA in view of SUNG, U.S. Patent 6,235,592. This rejection is respectfully traversed.

Claim 1 recites "forming a first dielectric layer over the surface of the interconnect structure". Preferably, a HDP oxide is formed as the first dielectric layer by high density plasma

chemical vapor deposition (HDPCVD) and the thickness is between 7000 to 10000Å (see page 8, lines 12-17, and FIG. 3A, for example). The Examiner does not explicitly indicate which layer disclosed by Bacchetta et al is the first dielectric layer. Neither layer 4 nor layer 2 taught by Bacchetta et al anticipates the first dielectric layer as claimed in claim 1 of the present application. The layer 4 is a material with a low viscosity and used to planarize the upper surface, as is well known by the skilled in the art. Typically, an SOG, a silane precursor in an organic liquid, is spun onto the entire surface and then cured. A partial etch-back of the SOG leaves it only in the deeper zones, as shown as 4 in FIG. 2, for example (see col. 5, lines 40-45). As such, the SOG layer 4 taught by Bacchetta et al does not fully cover the surface of the interconnect structure. It is respectfully submitted that the SOG layer 4 taught by Bacchetta et al. is a flowable material, which is only formed in the deeper zones, not on top of the structure 7.

On the other hand, the oxide adhesion layer 2 taught by Bacchetta et al. is formed over the portion of the first oxinitride layer not covered by the SOG, and over the residual SOG (see col. 5, lines 45-47). The oxide adhesion layer 2 is disposed between the layers 1 and 3 and serves no specific passivation function. It should be thin, with its thickness dimension being preferably on the order of a few tens of nanometer, specifically within the range of 5 to 50 nm (see col. 4, lines 9-13).

It is respectfully submitted that Bacchetta et al teaches away from the present application because Bacchetta et al. teaches an **oxide thin layer 2** (about 350Å thick) to improve adhesion between two layer 1 and 3. At most, Bacchetta et al discloses a thin oxide layer interposed between a first SiN or SiON and a second SiON to serve as an adhesion layer. The present application, however, does not need the first SiN or SiON, and thus the adhesion layer is not necessary in the present application. The purpose and motivation of the **oxide thin layer** taught by Bacchetta et al. are different from the thick high density plasma (HDP) deposited oxide in the present application. Moreover, the HDP oxide of the first dielectric layer as claimed in claim 1 provides excellent gap-filling ability. The first SiN or SiON disclosed in Bacchetta et al. with poor gap filling ability can cause device failure as processes scale down. As such, the present application is not anticipated or rendered obvious by Bacchetta et al.

The secondary reference utilized by the Examiner fail to overcome the deficiencies of the primary reference to Bacchetta et al.

Accordingly, reconsideration and withdrawal of the 35 USC 102(b) and 103 rejections are respectfully requested.

Allowable Subject Matter

Applicants gratefully acknowledge that the Examiner considers claim 12 to contain allowable subject matter. It is noted that this claim has been rewritten in independent form. Also, in view of the foregoing amendments and remarks, it is respectfully submitted that all claims should now be in condition for allowance. Reconsideration and withdrawal of the 35 USC 102(b) and 103 rejections are respectfully requested.

Conclusion

Favorable reconsideration and an early Notice of Allowance are earnestly solicited.

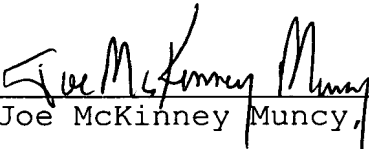
In the event the Examiner does not consider this application to be in condition for allowance, it is respectfully requested that this Amendment be entered for the purposes of Appeal. This Amendment should overcome the current grounds of rejection and therefore simplify the issues for Appeal. Nonetheless, it should be unnecessary to proceed to Appeal because the instant application should now be in condition for allowance.

In the event that any outstanding matters remain in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)